

AD-A035 986 COLD REGIONS RESEARCH AND ENGINEERING LAB HANOVER N H F/G 13/2  
LENS-SHAPED DWELLING FOR THE FAR NORTH (DOM-LINZA DLIA KRAINEGO--ETC(U)  
DEC 76

UNCLASSIFIED

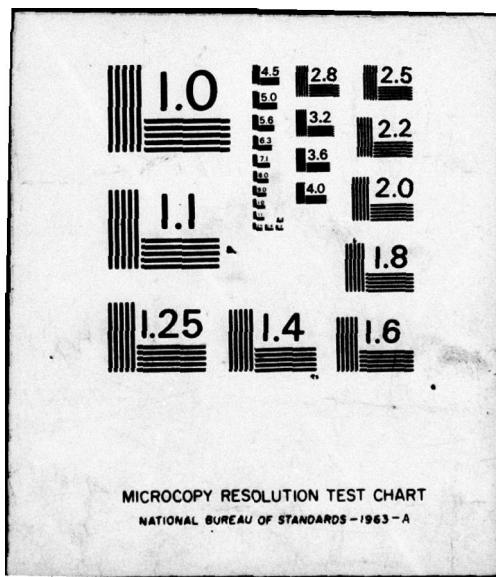
CRREL-TL-573

NL

| OF |  
AD  
A035986



END  
DATE  
FILMED  
3-77



TL 573



12 J  
Draft Translation 573

December 1976

ADA 035986

## LENS-SHAPED DWELLING FOR THE FAR NORTH

COPY AVAILABLE TO DDC DOES NOT  
PERMIT FULLY LEGIBLE PRODUCTION

D D C  
REF ID: A  
FEB 25 1977  
A

CORPS OF ENGINEERS, U.S. ARMY  
COLD REGIONS RESEARCH AND ENGINEERING LABORATORY  
HANOVER, NEW HAMPSHIRE

Unclassified

SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

REPORT DOCUMENTATION PAGE		READ INSTRUCTIONS BEFORE COMPLETING FORM
1. REPORT NUMBER <b>Draft Translation 573</b>	2. GOVT ACCESSION NO.	3. RECIPIENT'S CATALOG NUMBER
4. TITLE (and Subtitle) <b>LENS-SHAPED DWELLING FOR THE FAR NORTH</b>	5. TYPE OF REPORT & PERIOD COVERED	
7. AUTHOR(s)	6. PERFORMING ORG. REPORT NUMBER	
9. PERFORMING ORGANIZATION NAME AND ADDRESS <b>U.S. Army Cold Regions Research and Engineering Laboratory Hanover, New Hampshire</b>	10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS	
11. CONTROLLING OFFICE NAME AND ADDRESS	12. REPORT DATE <b>December 1976</b>	
14. MONITORING AGENCY NAME & ADDRESS (if different from Controlling Office)	13. NUMBER OF PAGES <b>3</b>	
	15. SECURITY CLASS. (of this report)	
	15a. DECLASSIFICATION/DOWNGRADING SCHEDULE	
16. DISTRIBUTION STATEMENT (of this Report)  <b>Approved for public release; distribution unlimited.</b>		
17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report)		
18. SUPPLEMENTARY NOTES		
19. KEY WORDS (Continue on reverse side if necessary and identify by block number) <b>HOUSES</b> <b>CONSTRUCTION MATERIALS</b> <b>PLASTICS</b> <b>THERMAL INSULATION</b> <b>ALUMINUM</b> <b>PREFABRICATION</b>		
20. ABSTRACT (Continue on reverse side if necessary and identify by block number)  <b>The design proposals and experimental models of a dormitory for four-five persons and a two-apartment dwelling were accomplished according to task 0.55230 of the plan of most important projects in the construction area "Develop and test experimental construction of new prefabricated, sectional-prefabricated and mobile lightweight dwellings using aluminum, polymers and other efficient materials for construction in the northern regions of the country and also types of enterprises for their manufacture."</b>		

(14) CRREL- TL- 573

DRAFT TRANSLATION 573

(6)

ENGLISH TITLE: LENS-SHAPED DWELLING FOR THE FAR NORTH

FOREIGN TITLE: (DOM-LINZA DLIA KRAINEGO SEVERA). A

(11) Dec 76

(12) GP.

AUTHOR: None

(21)

Trans. of

SOURCE: Leningrad. Series 123 of dwellings for climatic region,  
no. 1, Stroizdat, 1971.

(USSR) n1 3p 1971.

CRREL BIBLIOGRAPHY

ACCESSIONING NO.: 30-4627

Translated by U.S. Joint Publications Research Service for U.S. Army Cold Regions Research and Engineering Laboratory, 1976, 3p.

NOTICE

The contents of this publication have been translated as presented in the original text. No attempt has been made to verify the accuracy of any statement contained herein. This translation is published with a minimum of copy editing and graphics preparation in order to expedite the dissemination of information. Requests for additional copies of this document should be addressed to the Defense Documentation Center, Cameron Station, Alexandria, Virginia 22314.

1473  
037100

LB

## LENS-SHAPED DWELLING FOR THE FAR NORTH

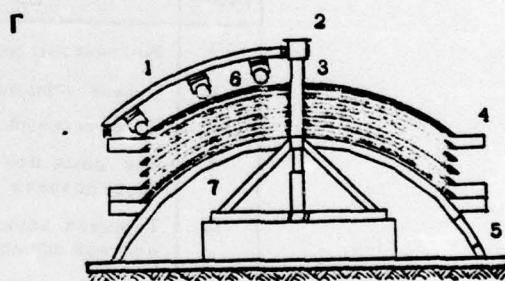
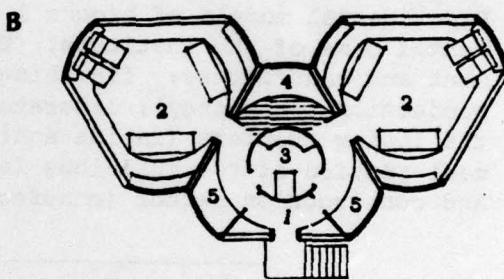
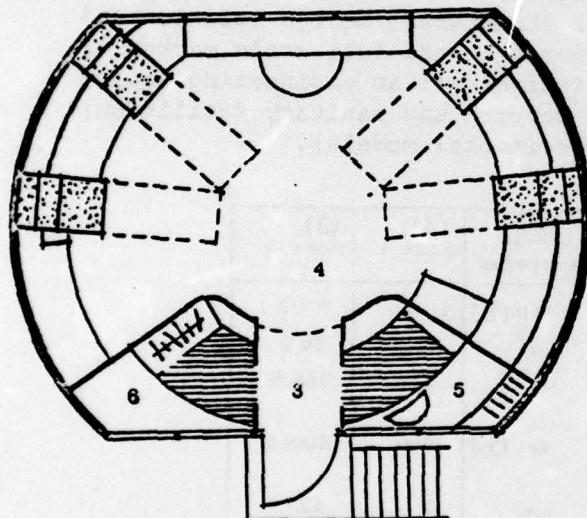
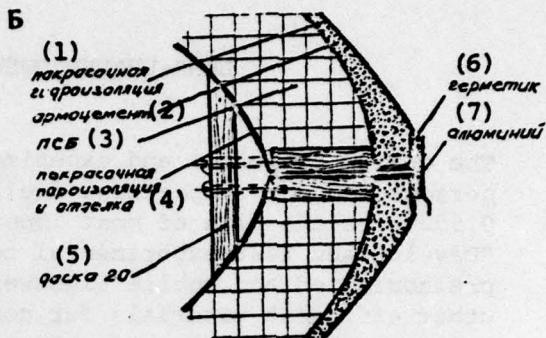
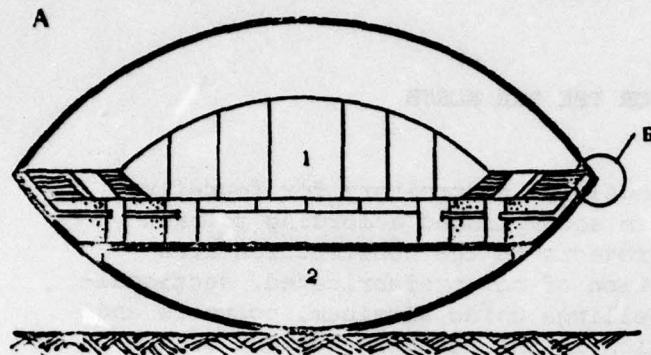
The design proposals and experimental models of a dormitory for four-five persons and a two-apartment dwelling were accomplished according to task 0.55230 of the plan of most important projects in the construction area "Develop and test experimental construction of new prefabricated, sectional-prefabricated and mobile lightweight dwellings using aluminum, polymers and other efficient materials for construction in the northern regions of the country and also types of enterprises for their manufacture."

Experimental models of blocks 1 and 3 were made at the scientific experimental base of the institute. The following were included in their development and manufacture: finishing of spatial structures (design solution and production technology); laboratory of a volumetric and full-scale markup of the living quarters (inside equipment and finishing); an engineering equipment section of the buildings (engineering support and sanitary facilities); and construction sector (manufacture of experimental models).

№№ (1)н/п	Основные показатели (2)	(3) Единица измерения	(4) Блок 1	(5) Блок 3
1.	Количество жителей (6)	чел.(13)	4-5	6-8
2.	Общая площадь(7)	м <sup>2</sup>	30,0	78,0
3.	Строительный объем (8)	м <sup>3</sup>	70,0	186,0
4.	Вес дома без внутреннего оборудования (9)	кг (14)	3800	3600x3
5.	Толщина верхней армированной оболочки (10)	мм	12	12
6.	Толщина утеплителя(11)	мм	100	100
7.	Трудоемкость формования и складных оболочек и сборки дома (12)	чел/ч(15)	570	1740

### KEY:

1. Number of item	8. Construction volume
2. Main indicators	9. Weight of building without inside equipment
3. Unit of measurement	10. Thickness of upper reinforced cement shell
4. Block 1	11. Thickness of insulation
5. Block 3	12. Labor consumption in shaping multilayered shells and assembly of building
6. Number of residents	13. мел
7. Total area	14. кг
	15. man-hours



A. Block 1. Dormitory for four-five persons. Cross-section and layout; 1 -- living quarters; 2 -- service compartments; 3 -- vestibule; 4 -- cabin for three-four persons; 5 -- kitchen; 6 -- closet. B. Assembly for joining upper and lower shells. C. Block 3. A two-apartment building. Layout: 1 -- vestibule; 2 -- quarters for three-four persons; 3 -- kitchen; 4 -- toilet; 5 -- closet. D. Diagram of equipment for test manufacturing of spherical shells; 1 -- gantry; 2 -- cap; 3 -- support column; 4 -- prefabricated-sectional ring; 5 -- access hatch; 6 -- working member; 7 -- matrix

KEY:

1. painted waterproofing	5. board
2. reinforced cement	6. seal
3. cellular foam cement	7. aluminum
4. painted vapor barrier and finishing	

The lens-shaped building of spherical prefabricated-sectional and portable shells is designed for construction of villages for expeditions, stations and watches with short operational periods and also for initial settlements of builders. These buildings may be used as individual types and in blocks — at stations with population up to 20 persons. However, they may also find application in larger settlements located in difficultly accessible places remote from railroads. A lens-shaped building is assembled from two shells in the form of spherical segments. The outer layer of the shell, which performs supporting and waterproofing functions, is made of reinforced cement, and the inside vapor barrier shell is made of cellular foam concrete. The design of the lens-shaped building is distinguished by simplicity and technological effectiveness, due to which its manufacture may be organized under test conditions. The spherical surface is very suitable in the static sense and makes it possible to achieve a rather strong and rigid structure, which easily tolerates various types of loads including dynamic loads, with minimum consumption of materials. A small enclosing surface which reduces heat losses is typical for lens-shaped buildings. The lens shape has an aerodynamic quality which eliminates snow accumulation, inevitable in the Arctic in villages of traditional construction. Ergonomic analysis of the symmetry of a lens-shaped building by human anthropometric data, carried out by the Leningrad Branch of VNIITE [All-Union Scientific Research Institute for Aesthetic Styling in Engineering] showed that all the required functional zones may be arranged within it, while the spherical shape is quite suitable for habitation. The building does not require installation of special foundations and land preparation. It can be transported in one piece along the ground and snow, towed through the water and may also be transported through the air by helicopter. The building is provided with an autonomous engineering equipment system with increased operational reliability.

Multiple full-scale tests of experimental models of blocks 1 and 3 will be carried out in 1973 at the scientific experimental base of the institute and work drawings for serial manufacture will also be worked out. The final conclusions and indicators will be obtained after testing of the lens-shaped dwelling under Arctic conditions.